

IN THE CLAIMS:

Please amend the claims as indicated below.

1. (Currently Amended) A method for decoding a multidimensional code, wherein a  
 5 multidimensional code symbol comprises a number of symbol components of lower dimensionality, said method comprising the steps of:

compensating for intersymbol interference caused by ~~previously decoded~~  
previously transmitted multidimensional code symbols by calculating intersymbol  
interference estimates based on one or more multidimensional code symbols; and

- 10                   compensating for intrasymbol interference caused by symbol components within a current multidimensional code symbol.

2. (Currently Amended) The method of claim 1, wherein multidimensional code symbols are transmitted over more than one symbol interval ~~associated with~~ that is used  
 15 to transmit one of said symbol components.

3. (Previously Presented) The method of claim 1, wherein said multidimensional code symbol comprises a number of transmitted symbol components of lower dimensionality that exceeds a number of available channels.

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4. (Currently Amended) The method of claim 1, further comprising the steps of:

~~calculating intersymbol interference estimates based on said previously~~  
~~decoded multidimensional code symbols;~~

- calculating intrasymbol interference estimates based on possible data  
 25 symbol values; and

calculating branch metrics based on a received signal and said intersymbol interference and intrasymbol interference estimates.

5. (Cancelled).

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6. (Cancelled).

7. (Cancelled).

8. (Cancelled).

9. (Original) The method of claim 1, further comprising the step of determining a best surviving path into a trellis state.

10. (Original) The method of claim 1, wherein said multidimensional code is 4D-TCM.

11-20. (Cancelled)

21. (Currently Amended) A system for decoding a multidimensional code, wherein a multidimensional code symbol comprises a number of symbol components of lower dimensionality, said system comprising:

means for compensating for intersymbol interference caused by ~~previously decoded~~ previously transmitted multidimensional code symbols by calculating intersymbol interference estimates based on one or more multidimensional code symbols; and

means for compensating for intrasymbol interference caused by symbol components within a current multidimensional code symbol.

22. (Previously Presented) The method of claim 1, further comprising the step of calculating a metric for an initial symbol component using survivor symbols from a corresponding state to account for intersymbol interference, wherein said metric is used for the calculation of a branch metric.

23. (Previously Presented) The method of claim 22, further comprising the step of calculating a metric for a subsequent symbol component using survivor symbols from a corresponding state to account for intersymbol interference and using at least one data estimate to account for intrasymbol interference.

24. (Previously Presented) The method of claim 23, further comprising the step of calculating a combined metric by combining said metric for said initial symbol component and said metric for said subsequent symbol component.

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25. (Currently Amended) The method of claim 24, further comprising the step of computing a branch metric for a transition in a ~~multidimensional~~ trellis using said combined metric.

10 26. (New) The method of claim 1, further comprising the step of calculating an intersymbol interference-free estimate using at least one survivor symbol from a survivor path into a state.

27. (New) The method of claim 26, wherein said intersymbol interference-free estimate is  
15 computed for a first and a subsequent symbol interval.

28. (New) The method of claim 27, further comprising the step of calculating an intersymbol interference and intrasymbol interference-free estimate based on said intersymbol interference-free estimate for said subsequent symbol interval and a data  
20 symbol that was determined based on said intersymbol interference-free estimate for said first symbol interval.

29. (New) The method of claim 28, further comprising the step of computing a distance metric for said first symbol interval based on said intersymbol interference-free estimate  
25 for said first symbol interval.

30. (New) The method of claim 29, further comprising the step of computing a distance metric for said subsequent symbol interval based on said intersymbol interference and intrasymbol interference-free estimate.

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31. (New) The method of claim 30, further comprising the step of computing a branch

metric for a transition in a trellis based on said distance metrics for said first and subsequent symbol intervals.

5 32. (New) The method of claim 31, further comprising the step of computing the best path into a state in said trellis.

33. (New) A system for decoding a multidimensional code, wherein a multidimensional code symbol comprises a number of symbol components of lower dimensionality, comprising:

10                   a decision feedback unit for compensating for intersymbol interference caused by previously transmitted multidimensional code symbols by calculating intersymbol interference estimates based on one or more multidimensional code symbols; and

15                   a branch metrics unit for compensating for intrasymbol interference caused by symbol components within a current multidimensional code symbol.

34. (New) The system of claim 33, wherein said multidimensional code symbol comprises a number of transmitted symbol components of lower dimensionality that exceeds a number of available channels.

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